

Abstract

The invention relates to an ion beam scanning system having an ion source device, an ion acceleration system and an ion beam guidance system comprising an ion beam outlet window for a converging centred ion beam, and a mechanical alignment system for the target volume to be scanned. For that purpose, the ion acceleration system can be set to an acceleration of the ions required to obtain a maximum depth of penetration. The scanning system also has energy absorption means arranged in the path of the ion beam between the target volume and the ion beam outlet window transverse to the centre of the ion beam. The energy absorption means can be displaced transverse to the centre of the ion beam in order to vary the energy of the ion beam, so enabling, in the target volume, depth modulation of the ion beam, which is effected by means of a linear motor and the transverse displacement of the energy absorption means, with depth-staggered scanning of volume elements of the target volume in rapid succession. The invention relates also to a method of ion beam scanning and a method of operating an ion beam scanning system using a gantry system.

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(71) Anmelder (für alle Bestimmungsstaaten ausser US):
**GESELLSCHAFT FÜR SCHWERIONENFORSCHUNG
MBH [DE/DE]; Planckstrasse 1, D-64291 Darmstadt (DE).**

(72) Erfinder; und

(75) Erfinder/Anmelder (nur für US): **KRAFT, Gerhard [DE/DE];
Planckstrasse 1, D-64291 Darmstadt (DE). WEBER, Ulrich
[DE/DE]; Planckstrasse 1, D-64291 Darmstadt (DE).**

(74) Anwälte: **BOETERS, Hans, D. usw.; Boeters & Bauer,
Bereiteranger 15, D-81541 München (DE).**

(81) Bestimmungsstaaten: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO Patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), eurasisches Patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), europäisches Patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI Patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

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(54) Title: **ION BEAM SCANNER SYSTEM AND OPERATING METHOD**

(54) Bezeichnung: **IONENSTRAHL-ABTASTSYSTEM UND VERFAHREN ZUM BETRIEB DES SYSTEMS**

(57) Abstract

The invention relates to an ion beam scanner system with ion sourcing equipment, an ion accelerator system and ion beam guide, containing an outlet aperture for a converging, centred ion beam and a mechanical alignment system for the target volume which is to be scanned. For this purpose, the ion accelerator system can be set to the acceleration required for maximum penetration depth of the ions. In addition, the scanning system has an energy absorption element, which is mounted in the path of the beam crosswise to the centre of the beam, between the target volume and the ion beam outlet aperture. The energy absorption element can be displaced crossways to the centre of the ion beam to vary the beam's energy, so that modulation of the ion beam depth which is effected by a linear motor and transversal displacement of the energy absorption element can be carried out in rapid succession by depthwise graduated scanning on volumetric elements of the target volume. The invention also relates to a method for ion-beam scanning and to a method for operating an ion-beam scanner system using a gantry system.

